THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OF PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

Sub A1

1. A method of producing an embryo comprising the steps of:

(a) harvesting a microspore-containing plant segment from a donor plant;

(b) incubating said segment under pre-treatment conditions to maintain a substantial portion microspores at a uninucleate cell cycle G1 phase;

(c) isolating microspores from said segment; and

(d) incubating said isolated microspores in an induction medium comprising arabinogalactan protein to induce embryogenesis, thereby producing embryos.

2. The method according to claim 1, wherein said donor plant, in step (a) is a cereal plant.

3. The method according to claim 2, wherein said cereal plant is wheat or barley.

4. The method according to claim 1, wherein said arabinogalactan protein in step (d) is present in said induction medium at a level of from about 1 mg/liter to about 100 mg/liter of induction medium.

5. The method according to claim 4, wherein said arabinogalactan protein is present in said induction medium at a level of from about 10 mg/liter to about 25 mg/liter of induction medium.

6. The method according to claim 5, wherein said arabinogalactan protein is present in said induction medium for about two weeks.

7. The method according to claim 1, wherein, in step (b), said substantial portion of microspores at a uninucleate cell cycle G1 phase comprises from 50% to about 100%.

8. The method according to claim 1, wherein said pre-treatment conditions in step (b) comprise a temperature of from about 3°C to about 10°C for 3 to 10 days and incubation in an aqueous solution having from about 0.2 mol/liter to about 1.0 mol/liter of sugar alcohol.

9. The method according to claim 8, wherein said sugar-alcohol is selected from the group comprising mannitol, maltitol, sorbitol, xylitol, and any combination thereof.

10. The method according to claim 1, wherein said pre-treatment conditions in step (b) comprise incubation in water at a temperature of from about 3°C to about 10°C for 7 to 28 days.

11. The method according to claim 1, wherein, in step (a), said microspore-containing plant segment is selected from the group consisting of tillers, florets, spikes, anthers, pannicles and tassels.

12. The method according to claim 1, wherein said microspores, in step (d) are incubated in said induction medium for a period of from about 3 to about 14 days.

13. The method according to claim 1, wherein said induction medium, in step (d), comprises an auxin.

14. The method according to claim 13, wherein said auxin is phenylacetic acid.

15. The method according to claim 1, wherein said induction medium, in step (d), comprises glutamine at a level of from about 500 to about 1000 mg/L.

16. The method according to claim 1, wherein said induction medium, in step (d), additionally comprises ovary co-culture.

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17. The method of claim 16, wherein the microspore, in step (a), is obtained from wheat.

18. A method of plant regeneration from microspores comprising the steps of:

(a) harvesting a microspore-containing plant segment from a donor plant;

(b) incubating said segment under pre-treatment conditions to maintain a substantial portion microspores at a uninucleate cell cycle G1 phase;

(c) isolating microspores from said segment;

(d) incubating said isolated microspores in an induction medium comprising an auxin to induce the production of embryos;

(e) incubating said embryos in a differentiation medium to produce differentiated embryos; and

(f) regenerating plants from said differentiated embryos.

19. The method of plant regeneration according to claim 18, wherein step (d) comprises placing embryos on a support.

20. The method according to claim 19, wherein said support comprises filter paper.

21. The method according to claim 18, wherein step (c) comprises blending or vortexing said segment in an aqueous solution of about 0.2 mol/liter to about 1.0 mol/liter sugar alcohol.

22. A method for microspore culture of a cereal plant comprising the steps of:

(a) incubating a microspore-containing cereal plant segment in a medium comprising arabinogalactan protein in a quantity of from about 1 mg/liter to about 100 mg/liter, to create embryos; and

(b) regenerating cereal plants from said embryos.

23. An embryo prepared by the method of claim 1.

24. A plant produced from the embryo of claim 23.

25. A method of introducing a gene of interest into a microspore comprising, introducing a genetic construct comprising said gene of interest into said microspore, said microspore obtained following the steps of pre-treatment (step (b)) and isolation (step (c)) as defined in claim 1.

26. The method of claim 25, wherein the step of introducing comprises particle bombardment.

27. The method of claim 25, wherein the step of introducing comprises *Agrobacterium* mediated transformation.

28. A transgenic microspore prepared by the method of claim 25.

29. A transgenic embryo produced from the transgenic microspore of claim 28.

30. A transgenic plant produced from the transgenic embryo of claim 29.